1 Safety Human Exposure

1.1 Radio Frequency Exposure Compliance

1.1.1 Electromagnetic Fields

RESULT: **Pass**

Report No.	:	**CN24OCEU 002**
Test Specification		
Test item	:	Digital Transmitter
Identification / Type No.	:	MMS915
FCC ID	:	EF400247
IC:		1078A-00247
HVIN	:	10033391-01
Test standard	:	CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 D01 v06 FCC KDB Publication 865664 D02 v01r02 RSS-102 Issue 5

1.1.1.1 RF Exposure Compliance Requirement for FCC

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

Max 1.82 dBi for 915MHz wireless.

- **Radio Frequency Exposure Limit**

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

➢ **Radio Frequency Exposure Calculation Formula**

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

or:

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

a) RF Exposure Evaluation standalone operations (worse case)

Mode	*Measured RF Output Power (dBm)	Ant. Gain (dBi)	Maximum EIRP (dBm)	Distance (cm)	Power Density (mW/cm²)	FCC Limit (mW/cm²)
915MHz	27.21	1.82	29.03	20	0.159	0.6

Note:
1. *915MHz RF Output Power: Refer to CN24OCEU 001.

➢ **Conclusion**

Therefore, the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.

1.1.1.2 RF Exposure Compliance Requirement for IC

The EUT shall comply with the requirement of RSS-102 section 2.5.2.

Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

The nominal maximum conducted output power specified:

Max 1.82 dBi for 915MHz wireless.

Table 1: Test Results of RF Exposure Calculations for ISED, Stand-alone mode

Mode	*Measured RF Output Power (dBm)	Ant. Gain (dBi)	Distance (cm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Threshold power (W)
915MHz	27.21	1.82	20	29.03	0.8	1.37
Note: The maximum EIRP lower than the threshold power in section 2.5.2, thus compliant.						

Note:

1. *915MHz RF Output Power: Refer to CN24OCEU 001.

- **Conclusion**

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."